Skin Cancer: Diagnosis and Treatment

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Skin cancer, the most common of all human malignancies, is also the easiest to completely cure when diagnosed early. Yet skin cancers cause over 8200 deaths a year in the USA, and these lesions cause hundreds of thousands to undergo costly and sometimes mutilating surgery. Early detection and treatment of skin cancer could prevent much of this morbidity and mortality.

Almost everyone has or develops skin growths at some time during his or her life. It is thus most important to distinguish premalignant and malignant growths from completely benign ones. The three most common forms of skin cancer are basal cell carcinoma, squamous cell carcinoma, and malignant melanoma. Many other types of cutaneous malignancies exist too, arising from different skin cells and appendages—such as adenocarcinomas of eccrine, sebaceous, and apocrine glands; Bowen's disease; erythroplasia of Queyrat; and intraepidermal carcinomas of Jadassohn-Borst and Paget. Other skin cancers include Kaposi's sarcoma, dermatofibrosarcoma protuberans, angiosarcoma, cutaneous lymphomas (especially mycosis fungoides), leiomyosarcoma, and metastatic lesions.

With increased media coverage and patient awareness of cutaneous disease, the primary care physician constantly gets asked, "Is this growth dangerous? Should it come off?" Nondermatologist physicians exhibit a marked lack of knowledge about malignant melanoma, other skin cancers, and their precursor lesions. The following illustrated summary should serve as an aid to identification and help distinguish benign from malignant skin growths.

Basal Cell Carcinoma

Basal cell carcinoma (BCC), the most common type of skin cancer in the United States (more than 400,000 new cases treated each year), occurs mostly in Caucasians, especially those with blue eyes and fair complexion who tend to burn rather than tan with sun exposure. BCC most often develops on sun-exposed areas, such as the face, neck, and hands. The incidence is directly proportional to sun exposure and inversely proportional to the natural degree of skin pigmentation. Very rare among blacks, these tumors typically affect sun-loving redheads and blondes.
Since chronic exposure to ultraviolet-B radiation fosters BCC genesis, the disease is also more prevalent among older persons. Other contributory factors include chemical carcinogens, such as arsenic found in insecticides, and genetic predisposition, found in patients with basal cell nevus syndrome.

The typical BCC is a smooth-surfaced, reddish to skin-colored nodule with a pearly sheen (Figure 1). Superficial, tiny blood vessels may overlie the growth, and dark pigmentation may be present. The latter, more common in darker-skinned individuals, represents melanocytes within the tumor. Such pigmentation does not parallel the malignant potential of the BCC. The growth rate of BCCs varies. Rapid enlargement may be associated with ulceration of the lesion as it partially outgrows its blood supply.

Some BCCs may have a keratotic surface crust, mimicking squamous cell carcinoma. Most early BCCs are asymptomatic, but bleeding may occur later. The flat, morpheaform type of BCC resembles scar tissue and can spread widely prior to diagnosis. Patients with BCC often have adjacent cutaneous manifestations of actinic (solar) damage—solar lentigines (sun freckles), dilated surface blood vessels (telangiectasia), premalignant actinic keratoses, and generalized wrinkling and solar elastosis.

The patient's history may vary a great deal with regard to tumor growth pattern, symptoms (itching, pain, or tenderness), and even prior skin trauma. Because the surface epidermis of the BCC is more friable than that of intact normal skin, the lesion bleeds rather easily. Primary cutaneous BCC does not have any relationship to internal malignancy.

Basal cell cancer now constitutes the most frequent postradiation tumor of the skin. The time lag between radiation and BCC appearance is often twenty years. Since the tumor develops in less than 5% of such radiation-treated patients, those affected may represent a genetically related group with inability to repair skin normally after x-ray exposure.
EXCISION OF BASAL CELL CARCINOMA

Small BCCs may be excised by transverse excision of the bulk of the tumor and then curettage and electrodesiccation to remove any underlying malignant cells.

BCCs are also more common in renal transplant patients, and incidence increases with time after transplantation.

Short-wavelength ultraviolet-B rays clearly contribute to human skin cancers. However, new research also incriminates longer-wave (above 320 nm) ultraviolet-A rays as a cocarcinogen or even a complete carcinogen. Thus, the falsely labeled “pure, safe” UVA rays used in tanning salons may, with repeated and prolonged exposure, also produce skin carcinomas.

Patients with basal cell nevus syndrome may have numerous BCCs, together with such miscellaneous manifestations as odontogenic cysts, bifid ribs, ocular hypertelorism, spina bifida, subnormal mentation, and palmar pitting. BCCs in this instance do not respond to topical 5-fluoroura-
cil (5FU) or 2,4-dinitrochlorobenzene (DNCB). Mohs' fresh tissue microscopic surgical technique of tumor removal is the treatment of choice, although photoradiation therapy employing systemically administered hematoporphyrin and locally applied 630-nm red light has proven successful experimentally.

Although basal cell carcinomas do not usually metastasize unless they grow very large or recur, their locally aggressive behavior can lead to marked disfigurement. Thus, early treatment is always best. One may excise small BCCs by transverse excision of the bulk of the tumor and then curettage and electrodesiccation to remove any underlying malignant cells (Figure 2). The overall recurrence rate with this procedure is less than 5%. Curettage alone gives the best cosmetic result but requires considerable expertise. Before using these techniques, one must inform the patient that the immediate post-surgical wound will include a thick black crust and that it takes one to three months for the tissue to regain an acceptable appearance (depending on the site of surgery). The appearance of this type of scar continues to improve with time.

A method that attempts surgical cure of BCC, cold steel scalp excision is done using local anesthesia followed by removal of the entire visible tumor plus 3- to 6-mm margins (to allow for any nonvisible extensions). This technique also has a less-than-5% recurrence rate and can give excellent cosmetic results. Scalpel excision provides the best specimen for histologic study. Immediate wound closure avoids the pain and unsightliness often associated with secondary intention healing. However, this procedure takes more time than curettage and requires follow-up for suture removal.

Radiotherapy, a well-established method of treatment for BCC, is usually reserved for older or debilitated patients or for lesions in areas inaccessible to surgical excision (eg, inner canthus of the eyelid or external auditory meatus of the ear). Postradiation scars tend to look worse with time; new actinic keratoses and squamous cell carcinomas may arise in such scars; and BCC recurrences after radiation therapy are difficult to treat.

Mohs' microscopically controlled surgery provides total removal of the skin tumor under histologically controlled conditions with maximal conservation of healthy surrounding tissue. This technique results in the lowest rate of recurrence and is used primarily for recurrent skin cancers, for lesions in sites where removal by other methods is often incomplete (like pinna, nose, and eyelid), or for lesions with very indistinct margins. Cure rates for periorbital basal cell carcinomas treated by Mohs' surgery are higher than those for similar lesions ablated by other modalities.

Advanced recurrent BCCs pose difficult management problems. Death often occurs from local invasion of vital structures, as well as from metastases. Combination chemotherapy (eg, cisplatin and doxorubicin) may have palliative effects in such severe cases.

Squamous Cell Carcinoma

Squamous cell carcinoma (SCC) is the second most common skin malignancy in the US. It occurs with a much greater frequency in the southern part of the country, since the amount of skin cancer in light-skinned people generally increases incrementally as proximity to the equator increases. Smegma may be carcinogenic if in contact with skin over a long period of time: circumcised men have a lower incidence of penile SCC than uncircumcised men. Most SCCs arise on skin previously damaged by sunlight, radiation, or an old scar, burn, or premalignant growth.

Squamous cell carcinomas usually appear red and raised, with a surface scale or horn (Figure 3). These lesions may ulcerate centrally. They almost always develop on a sun-exposed area of skin, most commonly the face, head, or hands. Although BCC incidence exceeds that of SCC for most parts of the body, SCCs are three times more frequent than BCCs on the hands.

Treatment of SCC resembles that of BCC, although it should be more aggressive—due to the fact that SCC is much more likely to metastasize than BCC if it recurs (Figure 4).

Melanoma

Malignant melanoma (MM) is generally regarded as the most dangerous and fatal of all skin cancers. This year, we anticipate about 25,000 new cases, with an estimated 6000 melanoma deaths in the US. Melanoma now accounts for about 2% of all deaths from cancer. The incidence has been doubling every ten years.
Contributory factors include prior sun exposure and precursor lesions (the lentigo maligna, the congenital melanocytic nevus, and the dysplastic nevus). Cumulative solar exposure correlates with an increased risk of malignant melanoma. Melanomas and other skin cancers arise at approximately the same level of the epidermis. People with actinic keratoses on their faces have a fourfold higher risk of getting melanoma. Thus, actinic tumors may act as “personal UV dosimeters” to indicate the likelihood of developing future melanomas.

Blacks have only one twentieth the incidence of MM whites have. Inability to tan in whites constitutes a most important risk factor, along with blue eyes, light or red hair, and heavy freckling of the skin. Increased exposure to solar radiation, associated with increased time for leisure activity, clearly plays a major role in the rising incidence of cutaneous MM. US veterans who served in the trop-
congenital nevi regardless of size.\textsuperscript{23}

In white populations, most cutaneous malignant melanomas fall into three categories: lentigo maligna melanoma, superficial spreading melanoma, and nodular melanoma.

The lentigo maligna, or Hutchinson’s freckle, is a hyperpigmented macule arising on sun-damaged skin that slowly enlarges to become a variegated hyperpigmented patch with irregular margins and color. When melanocytes invade through the epidermal basement membrane, this premalignant lesion progresses to the invasive stage of lentigo maligna melanoma (Figure 5). Lesions, often present for ten to 15 years before being brought to the attention of a physician, commonly grow on the cheeks, the nose, and the periorbital areas. Senile lentigines may mimic these lesions, and histologic confirmation is often necessary. The key to successful treatment is elimination of all atypical melanocytes, which may extend deep into the dermis and along pilary sheaths.

Superficial spreading melanoma, the most common type of MM, accounts for 70% of cases (Figure 6). Irregularities of color, size, shape, and margins assist in early diagnosis. Nodular melanoma, the second most common type (15%), usually presents as a rapidly growing, elevated mass with a smooth surface and a bluish-black color. Acral lentiginous melanoma affects the palms and soles and the subungual and periungual skin. Along with mucosal melanoma, it is the commonest type of MM in blacks and Asians.

Complete cure by surgical excision hinges on early diagnosis of MM and its precursors. In males, the back is the most common site; in women, the lower legs. Awareness of a recent change in size, color, or shape of a lesion is the most important clue to early diagnosis. Any suspicion of MM calls for skin biopsy. Although complete excision is obviously more desirable even at initial biopsy, partial biopsy of primary MMs less than 1.70 mm thick did not result in any deleterious effects.\textsuperscript{24} Even with punch biopsies, seeding into the dermis proves very uncommon.\textsuperscript{23}

Differential diagnosis includes vascular lesions, like venous lakes, hemangiomas, Kaposi’s sarcomas, and pyogenic granulomas, and pigmentary lesions, like nevi, seborrheic keratoses, pigmented BCCs, lentigines, blue nevi, and deep penetrating nevi.
LENTIGO MALIGNA MELANOMA

The lentigo maligna, or Hutchinson’s freckle, is a hyperpigmented macule arising on sun-damaged skin that slowly enlarges to become a variegated hyperpigmented patch. When melanocytes invade through the epidermal basement membrane, this premalignant lesion progresses to the invasive stage of lentigo maligna melanoma.

Lentigo maligna of left cheek, showing characterisitic irregularity of color and margins

Lentigo maligna melanoma on the neck, with irregularity of color, margins, and shape

Solar, or “senile,” lentigo on the lower lip, mimicking an early lentigo maligna melanoma but completely benign

Figure 5

lesion ulceration and microscopic satellites. Malignant melanomas with Clark levels less than IV and maximal thicknesses less than 0.76 mm generally have a very favorable prognosis, with some cure rates reported as close to 100%. But even such thin MMs can metastasize in as many as 5.5% of patients. Thus, even these low-risk patients should return for follow-up care at regular intervals after excision.

Immunologic interaction seems to exist between the host and the cutaneous melanoma. Spontaneous partial or total regression may occur in up to 13% of cases. A halo of depigmentation, due to antimelanocyte antibodies, may surround the primary tumor. All suspicious halo nevi should be excised or biopsied.

Dysplastic melanocytic nevi also represent distinct cutaneous markers for increased risk of developing malignant melanoma. These lesions have histologic features that resemble those of early melanomas. Most such nevi can be identified clinically in good light by experienced observers. Characteristics include irregularity of color, ill-defined borders that blend with surrounding skin, and sometimes a raised center that resembles a fried egg; stretching the nevus between the fingers can help elicit these findings. Patients with multiple dysplastic lesions and a positive family history of MM may be regarded as having the dysplastic nevus syndrome.

Premalignant Growths

Many of the skin changes we commonly associate with “old age” really stem from “photoaging” (excessive
sun exposure). Such changes include flat brown solar freckles, dilated surface blood vessels, open blackheads, more numerous and deeper skin wrinkles and furrows, yellowish and roughened patches of skin, and actinic keratoses.

Actinic (solar) keratosis (AK) is the most common precancerous skin lesion, often leading to SCC. AKs vary in hue from flesh-colored to tan, red, yellow, brown, or black. An AK usually has a surface crust, giving it a rough feel to the palpating finger. The patient often reports that the crust comes (or is scratched) off but recurs. The AK may bleed if the surface crust is allowed to build up; a cutaneous horn may form (Figure 8).

AKs typically develop on sun-exposed areas of fair-skinned people who live in warm climates. Incidence increases with proximity to the equator. AKs in automobile drivers more often affect the left side of the face due to the pattern of chronic sun exposure.

SCCs arising from AKs in Caucasians generally have low metastatic potential, but similar lesions in Japanese seem to behave in a more aggressive manner, with distant metastases fairly common. AKs are easily ablated cryosurgically with liquid nitrogen, leaving minimal scarring. Early studies suggest long-term use of topical tretinoin cream may decrease the incidence of AKs.

Multicentric, pigmented Bowen's disease is a relatively nonaggressive carcinoma in situ of the genitalia. We also call such Bowenoid papulosis "pigmented penile papules" in men and "reversible vulvar atypia" in women. Most common in young adults, it can also affect patients over 60 years old. The initial multicentric flat-topped or verrucous papules typically develop on the penile shaft or the labia majora and may coalesce to form plaques.

Although this disease usually runs a benign course, progression to invasive carcinoma has occurred; thus,
during hours of peak ultraviolet light flux (10:30 AM to 3:00 PM).

The importance of a complete skin exam cannot be overemphasized. The alert physician may save many lives by correct identification and excision of cutaneous malignancies.42-47

References


